

Performance of the IRI-2007 model for topside ion density and composition profiles during the 23/24 solar minimum

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Abstract

The recent solar minimum between cycles 23 and 24 was unusually extended and deep, resulting in an ionosphere that is significantly different from that expected based on previous solar minima. The ion density and composition estimates from the Communication/Navigation Outage Forecast System (C/NOFS) satellite are used to evaluate the performance of the IRI-2007 model between 400 and 850 km altitude in equatorial regions. The current model is shown to typically overestimate the expected topside density of O⁺ and underestimate the density of H⁺ during 2008 and 2009. The overestimation of ion density by IRI-2007 is found to vary with local time and longitude.